California Regional Water Quality Control Board
Central Valley Region
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23 August 2005

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7005 1160 0004 0127 0608

Mr. James Witty
Synagro West, Inc.
3845 Bithell Lane
Suisun City, CA 94585

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Christine and Dan Mahoney
P.O. Box 788
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NOTICE OF APPLICABILITY OF WATER QUALITY ORDER NO. 2004-0012-DWQ
(GENERAL WASTE DISCHARGE REQUIREMENTS FOR
THE DISCHARGE OF BIOSOLIDS TO LAND)
EMIGH SOUZA RANCH (SO-22)
SOLANO COUNTY

Synagro West, Inc. and Christine and Dan Mahoney (hereafter "Discharger") submitted a Notice of Intent for coverage under State Water Resources Control Board Water Quality Order No. 2004-0012-DWQ, the *General Waste Discharge Requirements for the Discharge of Biosolids to Land* (Biosolids GO), on 3 December 2004. Additional information was received on 6 July 2005.

Based on the information submitted in the Notice of Intent, the proposed land application of biosolids satisfies the general and specific conditions of Order No. 2004-0012-DWQ. Therefore, this letter serves as formal notice that the current Biosolids GO (Order No. 2004-0012-DWQ) is applicable to the sites and discharge described below.

Site Description
The original Notice of Intent states that biosolids will be applied to approximately 815 acres of agricultural land owned by Christine and Dan Mahoney. The land comprises five contiguous designated sites in the southeastern portion of Solano County as summarized below and depicted on Attachment A.

Site ID	Section	Township	Range	Gross Acreage
SO 22-1	11	T4N	R1E	308
SO 22-2	11	T4N	R1E	98
SO 22-3	11	T4N	R1E	149
SO 22-4	11	T4N	R1E	92
SO 22-5	14	T4N	R1E	168
Total Area (acres)				815

The terrain is gently sloped with elevations ranging from approximately 90 to 150 feet above mean sea level (MSL), and surface water drainage is to intermittent streams that traverse the site. Site soils are typically mixtures of clay, silt, and sand, and exhibit cation exchange capacities of 17 to 33 meq/100 g, which indicates slight to moderate potential for degradation of soil and land productivity from biosolids application. Soil pH values range from 5.6 to 6.4, indicating a moderate potential for crop damage and crop metals accumulation due to soluble metals in biosolids. The sites are typically planted to pasture grasses and wheat. The sites are not irrigated and receive approximately 15 inches of precipitation per year as the sole water source.

The Discharger submitted a Groundwater Assessment Report for the sites on 6 July 2005. Five shallow groundwater samples were obtained using direct push techniques from various locations on 9 June 2005 (see Attachment A). Information from the boring logs and groundwater analytical report is summarized below.

Sampling Location	Approximate Ground Surface Elevation (feet MSL)	Total Depth of Boring (feet)	Estimated Water Table Elevation (feet MSL)
SO 22-1	130	25	< 105 [1]
SO 22-2	90	25	79
SO 22-3	140	25	< 115 [1]
SO 22-4	140	25	< 115 [1]
SO 22-5	130	25	< 105 [1]

[1] Groundwater was not encountered in the boring.

Groundwater was encountered at approximately 10.5 below ground surface near the northeast corner of the proposed sites in SO 22-2. Unlike the other boring locations, which were in upslope areas, this location was near the topographic low point of the site approximately 10 feet above one of the intermittent stream channels. The estimated groundwater elevation at that location coincides with the approximate elevation of the streambed. Analytical results for the groundwater sample indicate that the groundwater was relatively saline, with 1,100 mg/L total dissolved solids, 300 mg/L chloride, 291 mg/L sodium, 6.7 mg/L nitrate nitrogen, and 9.7 mg/L total Kjeldahl nitrogen. Concentrations of certain metals exceeded applicable groundwater quality limits, as indicated in the table below.

	Arsenic	Cadmium	Copper	Lead	Mercury	Nickel
Groundwater Concentration (ug/L)	49.6	13.1	636	516	2.49	943
Applicable Water Quality Limit (ug/L)	0.004	0.07	170	2	1.2	12

The results, although limited and inconclusive, indicate that groundwater beneath the site contains high levels of metals, which may be naturally occurring.

To prevent groundwater degradation, the Discharger proposed to limit biosolids applications to areas of the site where the ground surface is higher than 90 feet MSL. However, because that elevation is apparently only 10 feet above the groundwater table, it is appropriate to the require that the Discharger limit biosolids applications for areas where the ground surface is higher than 105 feet MSL or monitor groundwater quality beneath fields SO 22-2 and SO 22-3.

Discharge Description

Biosolids will be applied no more than two years out of every five years, and only between April 15 and October 15. Biosolids will be incorporated into the soil on the same day, and will not be applied during precipitation events (as required by Solano County ordinance). Setbacks that comply with the Biosolids GO and Solano County Ordinance will be marked prior to each application. The overall facility perimeter and on-site drainages/creeks will have at least 33 feet of unmowed grass or similar vegetation. Therefore, storm water retention is not required.

Monitoring and Reporting Program

The Discharger shall comply with Monitoring and Reporting Program (MRP) No. R5-2005-0832, which is attached to this Notice, and which replaces Monitoring and Reporting Program No. 2004-0012-DWQ. The MRP is effective immediately, and requires monthly monitoring reports. If biosolids were not applied during a particular month, the monthly monitoring report shall so state.

Conditions That Must be Met Prior to Discharge

A. At least **15 days** before the first planned biosolids application, the Discharger shall submit the following to satisfy the Pre-Application Report requirement set forth in Provision D.1.a of the Biosolids GO:

    1. A Land Productivity Evaluation Report that complies with Item 10.A of the Pre-Application Report requirements in MRP No. 2004-0012-DWQ. The Land Productivity Report shall also consider whether soil pH control is needed to control leaching of soluble metals to the water table, and shall present a specific plan for soil pH monitoring and control.

B. The Biosolids Storage, Spill Response and Traffic, and Adverse Weather and Alternative Plans submitted with the NOI are adequate. The Discharger shall review these documents monthly during the application season for applicability, and any required revisions shall be submitted with the Monthly Monitoring Reports.

C. At least **15 days** before the first planned biosolids application, the Discharger shall submit proof of compliance with Provision D.5 of the Biosolids GO.

D. In determining allowable application rates to comply with Discharge Specification B.3, the Discharger shall calculate plant available nitrogen (PAN) using the procedure, volatilization factors, and mineralization rates described in Appendix E of the US Environmental Protection Agency's *Guide for Land Appliers* (EPA/831-B-93-002b), unless otherwise expressly approved. Determination of PAN shall

consider nitrogen mineralization from previous years' biosolids applications and all supplemental nutrient sources.

Other Conditions

E. Biosolids shall not be applied to any ground where the elevation is less than 105 feet MSL unless and until the Discharger installs groundwater monitoring wells in accordance with an approved workplan and begins groundwater monitoring in accordance with the MRP.

This letter serves as formal notice that Water Quality Order No. 2004-0012-DWQ is applicable to the fields described herein. If the discharge violates the terms or conditions of the General Order, the Regional Board may take enforcement action, including assessment of administrative civil liability. If you plan to change the method of discharge, you must submit a new NOI for coverage under the General Order or a Report of Waste Discharge (if you desire individual Waste Discharge Requirements) before any changes are implemented

If you have any questions regarding this Notice of Applicability, please contact Anne Olson at (916) 464-4740.

THOMAS R. PINKOS
Executive Officer

Enclosure: Attachment A
State Board Order No. 2004-0012-DWQ
Monitoring and Reporting Program No. R5-2005-0832

cc w/ enc.: Jeffrey Bell, Solano County Environmental Health Department, Fairfield
Mark Grey, Synagro West, Inc., Corona

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2005-0832
FOR
SYNAGRO WEST, INC. AND CHRISTINE AND DAN MAHONEY
EMIGH SOUZA RANCH (S0-22)
SOLANO COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring biosolids and biosolids land application areas. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Specific sampling locations shall be approved by Regional Board staff prior to implementation of sampling activities.

All samples shall be representative of the volume and nature of the material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form. Field test instruments (such as those used to measure pH and electrical conductivity) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

BIOSOLIDS MONITORING

Biosolids from each generator shall be sampled and analyzed as follows. Results for all chemical constituents shall be reported in mg/Kg on a dry weight basis. Composite samples may be used in lieu of grab samples if all required sample holding times are met.

For Generators Using Continuous Sludge Wasting and Disposal and for Pond Cleaning Projects:

		Sampling Schedule		
Constituent(s)	Sample Type	Small Generator [1]	Large Generator [2]	Reporting Frequency
Metals (total) [3]	Grab	1 per six months	1 per 200 dry tons; minimum of 1 per month	Monthly [6]
PCB arochlors, aldrin, dieldrin [4]	Grab	1 per six months	1 per 500 dry tons; minimum of 1 per six months	Monthly [6]
Semi-volatile organics [5]	Grab	1 per six months	1 per 500 dry tons; minimum of 1 per six months	Monthly [6]
Percent moisture	Grab	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [6]
Total nitrogen	Grab	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [6]

Constituent(s)	Sample Type	Sampling Schedule: Small Generator [1]	Sampling Schedule: Large Generator [2]	Reporting Frequency
Ammonia nitrogen	Grab	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [6]
Nitrate nitrogen	Grab	1 per quarter	1 per 200 tons; minimum of 1 per month	Monthly [6]
Total phosphorus	Grab	1 per quarter	1 per 200 tons; minimum of 1 per month	Monthly [6]
Total potassium	Grab	1 per quarter	1 per 200 tons; minimum of 1 per month	Monthly [6]

[1] Small generators are those that generate and/or land apply less than 350 dry tons per year (either during a cleanout project or by continuous wasting and disposal).
[2] Large generators are all others.
[3] Include at least the following metals: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.
[4] Using SW 846 Method 8080.
[5] Using EPA Method 8270.
[6] Include analytical data in the monthly monitoring report for the month in which monitoring occurred. For months in which no monitoring takes place, the Monthly Monitoring Report shall so state.

If, for a particular biosolids generator, it can be demonstrated that the generator's biosolids exhibit consistent chemical character over a period of at least two years, the applicable sampling schedule may be reduced by one-half upon written approval of a Biosolids Monitoring Data Summary Report. The report shall contain tabulated analytical data summaries for all biosolids monitoring data for the previous three years.

For Generators with Stockpile Disposal Projects:

Constituent(s)	Sample Type	Number of Samples
Metals (total)	Composite	1 per 200 dry tons; minimum of 1 per month
PCB arochlors, aldrin, dieldrin	Composite	1 per 500 dry tons; minimum of 1 per six months
Semi-volatile organics	Composite	1 per 500 dry tons; minimum of 1 per six months
Percent moisture	Composite	1 per 200 dry tons; minimum of 1 per month
Total nitrogen	Composite	1 per 200 dry tons; minimum of 1 per month
Ammonia nitrogen	Composite	1 per 200 dry tons; minimum of 1 per month
Nitrate nitrogen	Composite	1 per 200 tons; minimum of 1 per month
Total phosphorus	Composite	1 per 200 tons; minimum of 1 per month

Constituent(s)	Sample Type	Number of Samples
Total potassium	Composite	1 per 200 tons; minimum of 1 per month

The analytical data shall be presented in the monthly monitoring report(s) for the month(s) in which application of the biosolids occurs. For months in which no application takes place, the Monthly Monitoring Report shall so state.

ROUTINE FIELD MONITORING

The Discharger shall establish and implement an inspection and application oversight program to monitor and control biosolids application rates and ensure compliance with the WDRs. Each discrete application field shall be managed and monitored as follows:

1. Pre-application Oversight:
   a. Identify generator(s) whose biosolids are to be applied.
   b. Define crop to be planted.
   c. Calculate allowable loading rate based on soil nitrogen residual data from the previous fall and most recent plant available nitrogen (PAN) and moisture content data for the generator(s)' biosolids.
   d. Document communication of allowable loading rates to spreader operator.

2. Pre-application Inspection:
   a. Verify that setbacks are clearly delineated.
   b. Verify that runoff controls are in place and functional.
   c. Verify that culverts are blocked (where applicable).

3. Application Oversight:
   a. Verify compliance with setbacks and allowable loading rate.
   b. Verify compliance with soil incorporation requirements.

4. Post-application Oversight:
   a. Confirm with irrigation manager requirements to control runoff for the specified period after application.
   b. Calculate actual biosolids and PAN loading rates.
   c. Note anticipated dates of planting, irrigation, and harvest.

SOIL MONITORING

The Discharger shall establish an annual soil sampling program as follows: two background sampling locations outside of the land application areas (e.g., within application setback areas) and, at least six sampling locations within each discrete land application area identified in the Notice of Applicability.

Sampling locations shall be distributed to be representative of each subarea and predominant soil type. Soil samples shall be collected from each sampling location at the following depth intervals: 0 to 1 foot, 2 to 3 feet, and 5 to 6 feet below the ground surface. Each 12-inch sample shall be thoroughly mixed to create a composite sample representative of the depth interval, and shall be analyzed as follows:

Constituent/Parameter	Units	Sampling and Reporting Frequency [3]
Soil Classification (USCS and USDA)	--	Annually
Total Solids	% total weight	Annually
Total Alkalinity [1]	mg/Kg as $CaCO_3$	Annually
Cation Exchange Capacity [1]	meq/100 grams	Annually
Electrical Conductivity	mg/Kg, mg/L	Annually
Chloride [2]	mg/L	Annually
Iron [2]	mg/L	Annually
Manganese [2]	mg/L	Annually

[1] To be reported on a dry weight basis; show calculations.
[2] Analysis shall be performed on the extract obtained from the Waste Extraction Test using distilled water as the extractant.
[3] Samples shall be collected in the fall (fourth quarter). Sampling must occur at the same time each year.

Soil pH shall be monitored in accordance with the approved Land Productivity Evaluation Report.

GROUNDWATER MONITORING

Groundwater monitoring is required only if the Discharger wishes to apply biosolids to ground where the elevation is less than 105 feet above means ea level (MSL). Prior to construction of any groundwater monitoring wells, the Discharger shall submit a Groundwater Monitoring Well Installation Workplan to the Regional Board for review and approval. Upon completion and development of groundwater monitoring wells installed in accordance with the approved workplan, the Discharger shall implement the following groundwater monitoring program for all existing monitoring wells. Once installed, all new wells shall be added to the MRP, and all wells shall be sampled and analyzed according to the schedule below.

Prior to purging, groundwater elevations shall be measured, and the wells shall be purged of at least three well volumes until temperature, pH, and electrical conductivity have stabilized prior to sampling. Depth to groundwater shall be measured to the nearest 0.01 feet. Water table elevations shall be calculated and used to determine groundwater gradient and direction of flow. Samples shall be collected using approved EPA methods. Groundwater monitoring shall include, at a minimum, the following:

Constituent	Units	Type of Sample	Sampling and Reporting Frequency
Depth to groundwater	0.01 feet	Measurement	Quarterly
Groundwater elevation [1]	0.01 Feet	Calculated	Quarterly
Gradient magnitude	feet/feet	Calculated	Quarterly
Gradient direction	Degrees	Calculated	Quarterly
pH	std.	Grab	Quarterly
Total dissolved solids	mg/l	Grab	Quarterly
Nitrate nitrogen	mg/l	Grab	Quarterly
Ammonia nitrogen	mg/l	Grab	Quarterly
Total coliform organisms [2]	MPN/100 ml	Grab	Quarterly
Standard minerals [3]	mg/l	Grab	Annually
Metals [4]	ug/L	Grab	Annually

[1] Groundwater elevation shall be determined based on depth-to-water measurements using a surveyed measuring point elevation on the well and a surveyed reference elevation.

[2] Using a minimum of 15 tubes or three dilutions.

[3] Standard Minerals shall include, at a minimum, the following elements/compounds: calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.

[4] Metals shall include arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form using the format provided in the example tables, which are part of this MRP, or in another approved format so that the date, sample type (e.g., biosolids, soil, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported in the next scheduled monitoring report.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed and stamped by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Regional Board on the **1st day of the second month following the end of the monitoring period** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. A scaled site map depicting each discrete field, proprety boundaries, roads, on-site structures, surface water bodies, drainage features, and runoff controls (as applicable);

2. The results of biosolids monitoring for each generator whose waste was applied to land during the month. Specifically, tabulated data for each generator shall be provided using the attached Biosolids Monitoring Results form (or approved revision thereof). Laboratory analytical reports need not be included, but must be provided upon request;
3. The results of routine field monitoring. Specifically, tabulated information for each discrete application field used during the month shall be provided using the attached Field Monitoring Results form (or approved revision thereof);
4. For each biosolids generator and discrete application field, a comparison of monitoring data to the discharge specifications and an explanation of any violation of those requirements; and
5. If no biosolids were applied during the month, a letter report certifying that fact.

B. Quarterly Monitoring Reports

Beginning with the second quarter of 2005, the Discharger shall establish a quarterly sampling schedule for groundwater such that samples are obtained approximately every three months. Quarterly monitoring reports shall be submitted to the Board by the **1st day of the second month after the quarter** (i.e. the January-March quarterly report is due by May 1st). The Quarterly Report shall include the following:

1. Results of groundwater monitoring. The results of regular monthly monitoring reports for March, June, September and December may be incorporated into their corresponding quarterly monitoring report;
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged;
3. Calculation of groundwater elevations, an assessment of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends if any;
4. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal tends, with reference to summary data tables, graphs, and appended analytical reports (as applicable);
5. A comparison of the monitoring data to the groundwater limitations and an explanation of any violation of those requirements;
6. Summary data tables of historical and current water table elevations and analytical results;
7. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum; and
8. Copies of laboratory analytical report(s) for groundwater samples.

C. Annual Report

An Annual Report shall be prepared and submitted to the Regional Board by **1 February** each year. The Annual Report shall include the following:

1. The monthly monitoring report for the last month of the calendar year.
2. For each biosolids generator, a summary of all analytical data and verification of compliance with the biosolids monitoring requirements. Include all Biosolids Monitoring Results forms.
3. For each discrete application field, a chronological log of dates of biosolids application, irrigation, precipitation, and runoff control operations. Specifically, tabulated information for each discrete application field shall be provided using the attached Field Activities Summary form (or approved revision thereof).
4. For each discrete application field:
   a. Total cumulative metals loading rates as of the end of the previous calendar year;
   b. Calculation of the total metals and nitrogen loading rates for the year;
   c. The cumulative metals loading rates since biosolids land application began; and
   d. The cumulative metals loading rates to date as a percentage of the cumulative metals loading limits.
5. A report of soil monitoring, including:
   a. Sampling and analysis activities, including a scaled map of sampling locations;
   b. Tabulation of all soil analytical results;
   c. Historical time vs. concentration plots for each constituent at each sampling interval;
   d. A discussion of any observed spatial or temporal variation; and
   e. Whether pH adjustment is needed and, if so, how and when the adjustment will be made.
6. A groundwater monitoring summary report including:
   a. The contents of the regular groundwater monitoring report for the last sampling event of the year;
   b. If requested by staff, tabular and graphical summaries of all data collected during the year;
   c. An evaluation of the groundwater quality beneath the site;
   d. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements;
   e. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
   f. The results for groundwater analyses that are performed annually.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall clearly indicate the Discharger's name, facility or site name, county, monitoring period, and type of report (i.e., monthly, quarterly, or annual). The letter shall include a discussion of any requirement violations during the reporting period and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. Pursuant to the Standard Provisions and Reporting Requirements, the transmittal letter shall contain a statement by the Discharger or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge, the report is true, accurate, and complete.

The Discharger shall implement the above monitoring program as of the date of this Order.

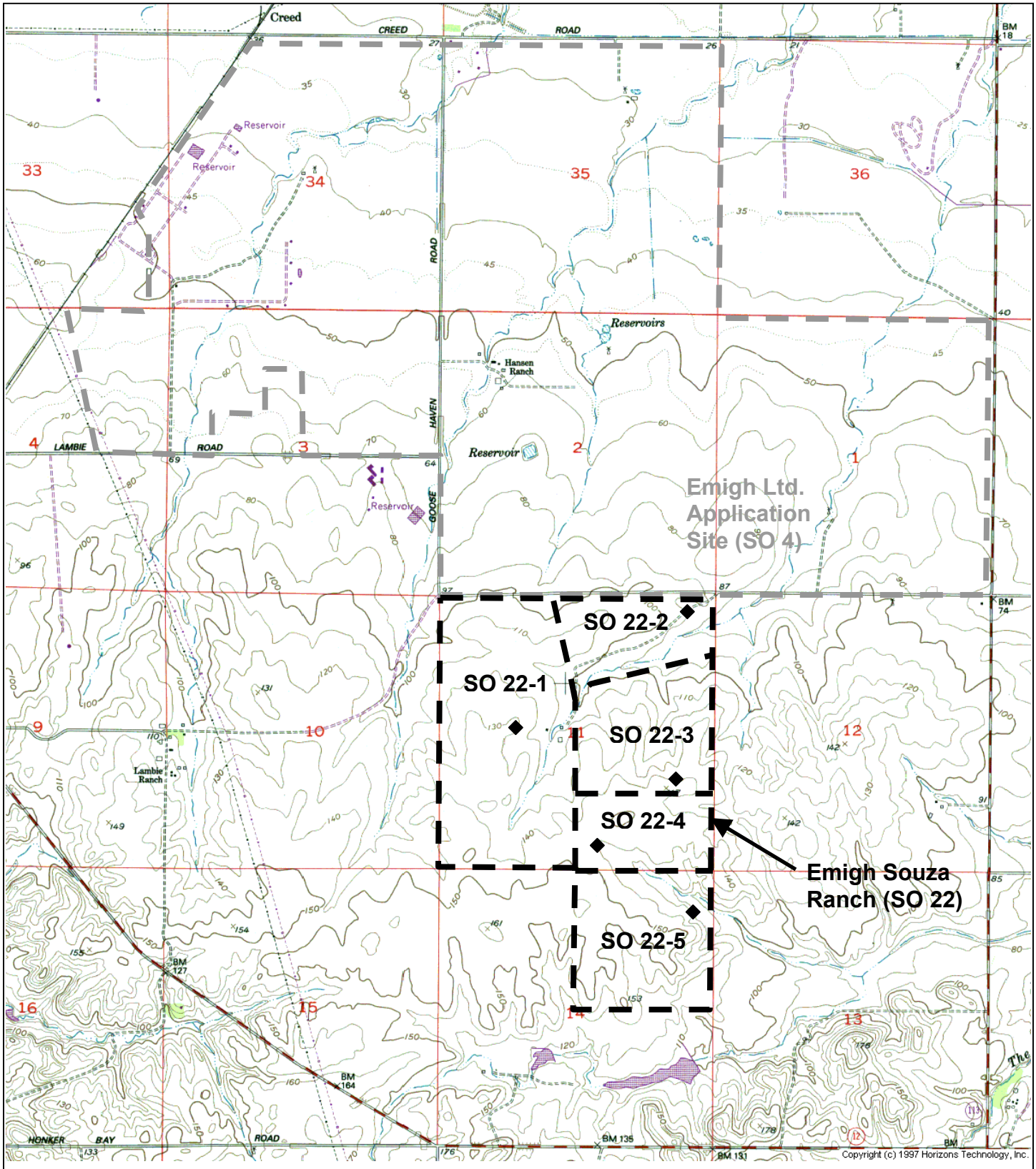
Ordered by: _____
THOMAS R. PINKOS, Executive Officer

_____
(Date)

Attachments Biosolids Monitoring Results form
Monthly Field Monitoring Results form
Annual Field Activities Summary form

ALO:09/16/05

ATTACHMENT A



Site Plan
Synagro West, Inc. and Christine and Dan Mahoney
Emigh Souza Ranch (SO-22)
Solano County

Reference:
USGS 7.5 minute map Rio Vista Quadrangle

◆ Hydropunch groundwater sampling location, June 2005

N

Scale: Approx. 1" = 2,640'